

p. 329. For *Monticola cyanus* read

***Monticola solitarius.***

*Turdus solitarius* Linnæus, Syst. Nat. 1758, p. 170 : Italy (ex Willughby).

The oldest name of the Blue Rock-Thrush is that of the 10th ed. of Linnæus Syst. Nat.; in the 12th ed. it was re-named *Turdus cyanus*.

p. 351. For *Porphyrio porphyrio* read

***Porphyrio madagascariensis.***

*Gallinula madagascariensis* Latham, Index Orn. Suppl. 1801, p. lxxviii : Madagascar.

Dr. Hartert (Nov. Zool. xxiv. 1917, p. 265) has recently shown that there is no justification for using the name *Porphyrio porphyrio* (Linn.) for this African species, and that the first available name for it is that of Latham.

XIII.—*A Note on the Structure of the Feather.*

By JOHN S. GLADSTONE, F.Z.S..

(Plates V–VII.)

FOR some time past I have been engaged on the photographic analysis of a feather, and my attention has been concentrated on the glazed portion of the underside of the primaries of certain birds. Chandler (University of California Publications, Zoology, xiii. 1916, pp. 243–446), referring to the subject states:—

“The ventral edges of the rami are produced into horny keels usually with no evident cell structure, known as the ventral ridges. Although in the great majority of birds the ridge forms only a narrow, inconspicuous border for the ramus, in a few birds it is extraordinarily developed as a very thin translucent film, which bends distally and overlaps the following

ramus, giving a smooth, glazed appearance to the under surface of the feather which is conspicuous at the most casual glance.”

My examination of the ventral ridge indicates that when present in complete form it extends about half the length of the barbs. It is widest at the rhachis end and tapers to a fine point. Prior to perusal of Chandler's work I named this cover of the space between the barbs as the “tegmen,” which for convenience I continue to use, as there is a considerable difference between a ventral ridge and a fully-developed tegmen.

The tegmen is particularly developed in water- and game-birds as well as in the Turkey. The Heron has a dark brown ventral ridge which, though not large enough to form a complete tegmen, is sufficient to create the general appearance of tegmenous structure, but instead of a glazed surface it resembles brown velvet when the feather is held at a suitable angle to the light. I find this Heron-like structure is not uncommon, but as it does not come under the head of “a tegmen” the subject has not been specially studied.

I find three types of barbs:—

1. The flat barb, which may or may not have a ventral ridge and gives no indication whatever of a tegmen.
2. The curved barb, which, having a coloured ventral ridge, gives a tegmenous appearance to the underside of a feather.
3. The flat or curved barb with fully-developed tegmen.

Type 1 includes the Passeres, Picariæ, Columbæ, Fulicariæ, Alectorides, and Pygopodes.

Type 2 is represented by the Accipitres, Steganopodes, Herodiones, Pteroclitæ, and Limicolæ.

Type 3 is found in the Striges, Anseres, Gallinæ, and Gaviæ.

The following is a description of the photographs which I have prepared in studying this structure:—

Plate V. fig. 1 is a portion of the underside of a Pink-footed Goose primary, magnified six times. The lower

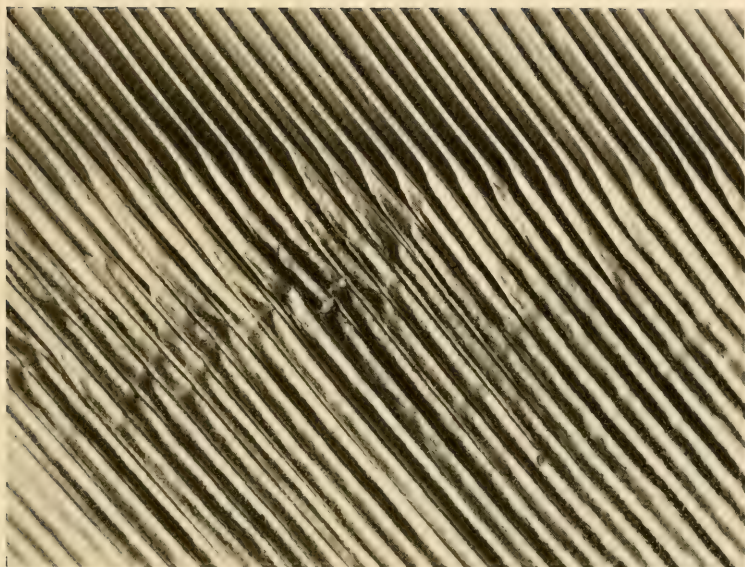


Fig. 1. Mag. 6.

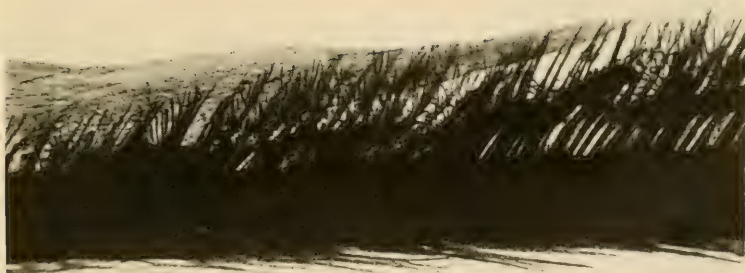


Fig. 2. Mag. 55.

STRUCTURE OF FEATHERS.

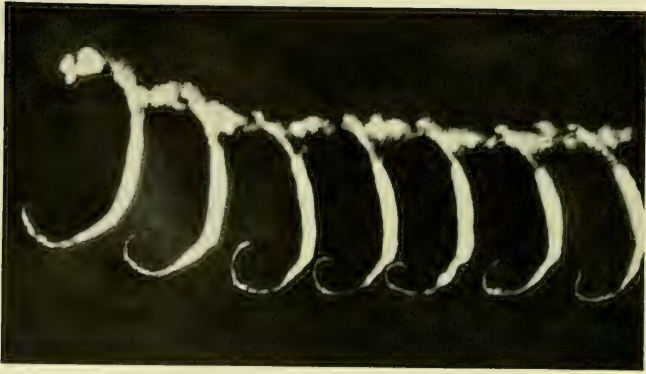


Fig. 1. Mag. 22.



Fig. 2. Mag. 22.



Fig. 3. Mag. 22.

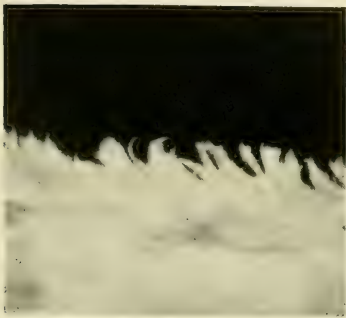


Fig. 4. Mag. 150.

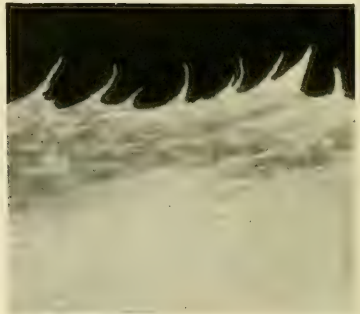


Fig. 5. Mag. 150.

STRUCTURE OF FEATHERS.



two-thirds of the illustration shows the tegmen covering the space between the barbs. The barbs in the upper one-third have open spaces between them with background of barbules.

Plate V. fig. 2 is a portion of a barb from a Goosander primary, magnified 55 times. This view shows the barb from the side, and it will be seen that the tegmen entirely covers the barbules on the left. Towards the right the tip of the tegmen has become detached from the barb, which is not usual.

The tegmen appears in two forms, (1) a flat cover, (2) a curved cover. There does not appear, however, to be any particular system about the construction, for while the Buzzard, Blackcock, Grey Partridge, Grouse, and Duck have a flat tegmen, the Turkey, Pheasant, Capercaillie, Goosander, Gull, and Owl have a curved tegmen.

Plate VI. fig. 1 is the sectional surface of seven barbs (in their original position) of a Turkey's primary, magnified 22 times. Here the impossibility of securing good definition over the whole had to be met with an average focus. The distal and proximal barbules are seen interlacing above and from them depend the seven barbs, each barb terminating in the curved form of tegmen which should close the space between the barbs, but in arranging the subject it was difficult to avoid disturbance.

Plate VI. fig. 2. The above explanation applies to this illustration, which represents a Pink-footed Goose's primary. The barbules extend along the upper surface and the tegmen appears as a flat cover on the lower side. In the original position the construction was that of a series of tubes, but in order to show the tegmen the barbs had to be slightly separated.

Plate VI. fig. 3 is a section similar to the above from a Heron's primary. The section was cut outside the semi-tegmenous area. This photograph was made to show an instance of "no tegmen." The barbules are seen above and the vertical pointed barbs below, showing the absence of tegmen at the tips.

It is curious that although the tegmen appears on the Pheasant, Blackcock, Grey Partridge, Capercaillie, Ptarmigan (summer and winter plumage), and Turkey, it is not found on the Domestic Fowl or Red-legged Partridge. The Partridge, Grouse, Blackcock, and Pheasant being so closely allied, it is remarkable that, as far as my investigations go, I should not have found the tegmen in the Red-legged Partridge. It is beyond the scope of these notes to go deeper into this subject, but it seems to me that the absence or presence of the tegmen may well prove to be a diagnostic character which so far has escaped the attention of systematic ornithologists.

The Red-legged Partridge has on the inner vane of the primary a narrow ventral ridge with a smooth edge, while towards the base of the outer vane the ventral ridge is larger and has a strongly fringed edge.

Plate VI. fig. 4, with magnification of 150 times, shows an example of this fringed edge.

The Grey Partridge has on the inner vane a tegmen with smooth edge, and on the outer vane a ventral ridge more or less fringed.

Plate VI. fig. 5, with magnification of 150 times, is given as a sample of this type of fringe.

The Grouse outer vane has a tegmen with a trace of fringe here and there. The Pheasant outer vane has a ventral ridge with rough edge and irregularly fringed. The Blackcock outer vane has a tegmen with light fringe commencing about half way from the base. The Capercaillie outer vane has a tegmen with rough edge, with very little trace of fringe.

The presence of tegmen is not restricted to the primaries, for I find it on the tail-feathers of the Grouse and Blackcock, while in the Capercaillie it is most marked. It does not appear on the tail-feathers of the Pheasant, Grey Partridge, or Red-legged Partridge.

Plate VII. fig. 1 was made to show the difference in structure between the barb and tegmen. The dark mottled portion is barb, and the lower and lighter portion



Fig. 1. Mag. 50.

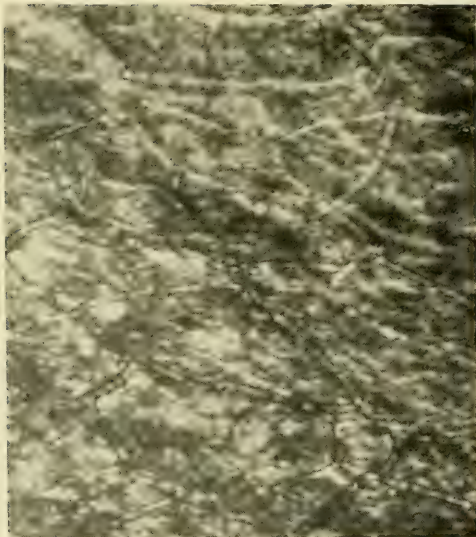


Fig. 2. Mag. 500.

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is tegmen. This subject was made from a barb cut from a Pink-footed Goose primary with magnification of 50 times.

Plate VII. fig. 2 is an attempt to show the superficial structure of the tegmen of a Pink-footed Goose. It was made with a magnification of 500 times.

At the commencement of these notes it was stated that I was engaged on the photographic analysis of a feather. These notes on the tegmen form a portion of the whole work, which it is hoped to publish before long in complete form.

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#### XIV.—*The Birds of the Isle of May: A Migration Study.*

By EVELYN V. BAXTER and LEONORA JEFFREY RINTOUL.

##### INTRODUCTION.

THE Isle of May has long been known as a very favourable station for the observation of bird migration. It stands at the entrance of the Firth of Forth, and is separated from the land by a distance of five miles on the north and ten on the south. It is about a mile long and half a mile wide; the rocks on the west and south-west sides are very precipitous, rising to a maximum height of 180 feet above the sea; they are intersected by caves, are basaltic in formation, and of a crumbling consistency, making any attempt at cliff-climbing dangerous. On the north and east the land slopes gradually down to the water's edge, broken by inlets on the eastern side. Parts of the island were formerly cultivated, but now the greater portion is covered with rough grass interspersed with rocks: here and there, patches of thistles, nettles, and hemlock occur, and these, together with the gardens of the lightkeepers, form the only covert available for the birds which visit the island. On the west of the island the cliffs are broken by a ravine, the precipitous sides of which rise to a height of 100 feet, and in which lies a partly artificial lake; small pools are found in the shallow depressions on the grass-grown plateaux and rock-pools close to sea-level.